Remarks

The Office Action mailed June 24, 2003 has been carefully reviewed and the following remarks are made in consequence thereof.

Claims 1-2, 4-11, and 13-20 are now pending in this application. Claims 1-20 stand rejected. Claims 3 and 12 have been canceled. The amendment filed May 6, 2003 stands objected to.

The objection to the amendment filed May 6, 2003 is respectfully traversed. Applicant submits that "rms" is supported in the original specification because, as is known to one skilled in the art, a statement of a voltage with nothing more refers to an rms voltage. As such, references in the original specification to "voltage supply", "nominal voltage", "220 volt environment", "approximately 198 volts", "approximately 242 volts", "187 volts", "253 volts", and "line voltage" would be understood to one skilled in the art as already referring to rms voltages.

Additionally, as stated in American Electricians' Handbook, twelfth edition, page 9-7, voltage is defined as, "[t]he greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned." Applicant respectfully submits after reading the claims in light of the specification, one skilled in the art would recognize a reference to a voltage as being a reference to an rms voltage unless indicated otherwise. Accordingly, Applicant submits, no new matter has been added to the specification and claims.

Further, as stated in the Office Action, "[t]he root mean square (RMS) or effective voltage is the conventional term to refer to an AC voltage." The original specification included the term "voltage" and was subsequently amended to "rms voltage" not, as suggested in the Office Action, to "overcome the Allos reference" but, rather to aid the examiner in differentiating the use of the term "voltage" in the present invention with the function described in the Allos reference. The Allos reference explicitly describes using peak voltage features of the sinusoidal wave to trigger certain components in the Allos device. The present specification does not describe nor suggest using peak voltage features of the sinusoidal wave.

As is known in the art and as described as a conventional term to an AC voltage, RMS may be expressed as:

$$V_{rms}=\sqrt{V^2},$$

For a sinusoidal voltage wherein $V=V_0\omega t$,

$$V_{rms}=\sqrt{V_0^2\cos^2(\omega t)},$$

$$V_{rms}=V_0\sqrt{(\cos^2(\omega t))}, \text{ where}$$

V_0 is the peak voltage amplitude of the sinusoidal voltage,

ω is the period of the sinusoidal wave, and

t is the time.

From the above, it is clear that the rms voltage (V_{rms}) is not the same parameter as the peak voltage (V_0). As can also be seen from the above is that V_{rms} changes instantaneously and does not need to wait for the end of a period to be computed, much like a moving average of a varying signal or sequence of numbers. As is known, the period may also be varying and V_{rms} may still be calculated. Accordingly, Applicants respectfully submit that monitoring a voltage in rms may be accomplished instantaneously and that a high or low rms voltage may be detected instantaneously.

Applicants respectfully submit that one skilled in the art would understand the operation of high and low rms voltage detection given the circuit schematic diagram of Figure 2 and in light of the specification. The Federal Circuit has opined in *Verve LLC v. Crane Cams, Inc.*, 65 USPQ 2d 1051, 1053-1054 (Fed. Cir. 2002), that "[p]atent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field." Accordingly, an additional explanation of a schematic diagram of the circuit shown in Figure 2 is not necessary and Applicant respectfully submits that after reading the claims in light of the specification and the figures, one skilled in the art would understand the operation of the electrical circuit depicted in Figure 2 given the circuit component rating values, pin outs, and/or part numbers contained therein.

For the reasons set forth above, Applicant respectfully requests that the objection to the amendment under 35 U.S.C. § 132 be withdrawn.

The rejection of Claims 1-20 under 35 U.S.C. § 112 first paragraph is respectfully traversed.

Applicant respectfully submits that an artisan of ordinary skill in the art reading the disclosure, would understand that a reference to a voltage refers to an rms voltage unless other wise indicated. As is defined in America Electricians' Handbook, twelfth edition page 9-7, the voltage (of a circuit) is understood by those skilled in the art to be a reference to an rms voltage unless otherwise indicated. As such, Applicant respectfully submits that such a limitation is supported by the specification. As discussed above, and is known in the art, an rms voltage may be computed instantaneously, and therefore computation does not require waiting for the expiration of a period to perform the calculation.

Accordingly, for at least the reasons set forth above, Applicant respectfully requests the rejection to Claims 1-20 under section 112, first paragraph be withdrawn.

The rejection of Claims 10-20 under 35 U.S.C. § 112 first paragraph is respectfully traversed. Applicant respectfully submits that Claims 10-20 satisfy Section 112, first paragraph. Claims 10-20 are rejected under Section 112 as being "single means claims." Applicant does not believe that this rejection is properly applied to Claims 10-20 because Claims 10-20 are not recited in "means-plus-function" language. Specifically, Claim 10 recites "[a] circuit...configured to monitor...." As such, Claims 10-20 are recited as a structure configured according to a claimed limitation, which is not in means-plus-function format. Applicant respectfully submits that one skilled in the art, after reading the specification in light of the Figures, would understand that no gap between necessary structural connections exists and that Applicant was in possession of the invention at the time of filing. Applicant therefore respectfully submits that Claims 10-20 meet the requirements of Section 112, first paragraph.

Accordingly, Applicant respectfully requests that the rejection of Claims 10-20 under Section 112, first paragraph, be withdrawn.

The rejection of Claims 10-20 under 35 U.S.C. § 112 second paragraph is respectfully traversed. Applicant respectfully submits that Claims 10-20 satisfy Section 112, second

paragraph. Claims are considered to be definite, as required by the second paragraph of 35 U.S.C. § 112, when they define the metes and bounds of a claimed invention with a reasonable degree of precision and particularity. See In re Venezia, 530 F.2d 956,958, 189 USPQ 149, 151 (CCPA 1976). Specifically, Claim 10 recites a circuit for protecting an electrical device wherein the circuit is configured to "monitor a line rms voltage to detect a rms voltage above a predetermined rms voltage range...monitor the line voltage to detect a voltage below the predetermined rms voltage range...electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined rms voltage range is detected...restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range." Claim 10 recites a circuit for protecting an electrical device wherein the circuit is configured to "monitor a line rms voltage to detect a high rms voltage condition such that the voltage is above a predetermined rms voltage range...monitor the line rms voltage to detect a low rms voltage condition such that the rms voltage is below the predetermined rms voltage range...electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high rms voltage condition and a low voltage condition is detected...monitor the line rms voltage after electrically isolating the electrical device to detect a line rms voltage within the predetermined range...restore power to the electrical device when the line rms voltage is detected to be within the predetermined rms voltage range...provide a visual indication when a low rms voltage condition is detected...provide a visual indication when a high rms voltage condition is detected...provide a visual indication when the rms line voltage is being tested."

As such, Claims 10-20 are recited as a structure configured according to a claimed limitation. Applicant respectfully submits that one skilled in the art, after reading the specification in light of the Figures, including a schmatic diagram, would understand the metes and bouonds of that a circuit configured as claimed in the present claims. Applicant therefore respectfully submits that Claims 10-20 meet the requirements of Section 112, second paragraph.

Accordingly, Applicant respectfully requests that the rejection of Claims 10-20 under Section 112, second paragraph, be withdrawn.

The rejection of Claims 1-20 under 35 U.S.C. § 102(b) as being anticipated by Allos (U.S. Pat. No. 4,707,760) is respectfully traversed.

Allos describes a mains protection device for AC mains including a voltage supply circuit (1), a voltage comparison circuit (2), a control circuit (3), and an output and status display circuit (4). In normal operation, the device detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state, i.e. a high condition at the output of NAND gate IC3N. When the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state (a low state at the output of NAND gates IC3N) at the end of that period if the peak remains within range.

Claim 1 recites a method for protecting an electrical device, the method comprising the steps of "monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range...monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range...electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected...restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Allos does not describe or suggest a method for protecting an electrical device wherein the method comprises monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range, monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range, electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, and restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Moreover, Allos does not describe or suggest monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range and monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range. Additionally, Allos does not describe or suggest monitoring a line rms voltage. Rather, in contrast to the present invention, Allos describes at column 2, lines 57-59 (emphasis added), "[i]n such normal operation, during evey (sic) a.c. cycle the voltage of the cycle will exceed

the low-level voltage limit on the lower voltage comparator, IC2D." At column 2, lines 65-67, Allos also recites, "[a]s the multivibrator IC4L is re-triggered every ac cycle (20 ms for 50 Hz) the output "Q1" is maintained in a logic 1 state." Further at column 3, lines 5-6, Allos recites, "[t]he window might be set at .+-.5% to .+-.15% of the peak rated value for the mains." Moreover at column 4, lines 10-18, "the described embodiment detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state...[w]hen the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state." Accordingly, Allos describes the operation of a circuit that operates using the sinusoidal characteristics of the supply voltage, and does not describe nor suggest using the rms characteristics of the supply voltage. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Allos.

Claims 2-9 depend from independent Claim 1. When the recitations of Claims 2-9 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2-9 likewise are patentable over Allos.

Claim 10 recites a circuit for protecting an electrical device wherein the circuit is configured to "monitor a line rms voltage to detect a rms voltage above a predetermined voltage range...monitor the line rms voltage to detect a rms voltage below the predetermined range...electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected...restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Allos does not describe or suggest a circuit for protecting an electrical device wherein the circuit is configured to monitor a line rms voltage to detect a rms voltage above a predetermined voltage range, monitor the line rms voltage to detect a rms voltage below the predetermined range, electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected, and restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Moreover, Allos does not describe or suggest a circuit that is configured to monitor a line rms voltage. Rather, in contrast to the present invention, Allos describes at column 2, lines 57-59 (emphasis added), "[i]n such normal operation, during evey (sic) a.c. cycle the

voltage of the cycle will exceed the low-level voltage limit on the lower voltage comparator, IC2D." At column 2, lines 65-67, Allos also recites, "[a]s the multivibrator IC4L is re-triggered every ac cycle (20 ms for 50 Hz) the output "Q1" is maintained in a logic 1 state." Further at column 3, lines 5-6, Allos recites, "[t]he window might be set at .+-.5% to .+-.15% of the peak rated value for the mains." Moreover at column 4, lines 10-18, "the described embodiment detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state...[w]hen the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state." Accordingly, Allos describes the operation of a circuit that uses the sinusoidal characteristics of the voltage supply to function and does not describe nor suggest rms characteristics of the voltage supply to function. Accordingly, for at least the reasons set forth above, Claim 10 is submitted to be patentable over Allos.

Claims 11-19 depend from independent Claim 10. When the recitations of Claims 11-19 are considered in combination with the recitations of Claim 10, Applicant submits that dependent Claims 11-19 likewise are patentable over Allos.

Claim 20 recites a circuit for protecting an electrical device wherein the circuit is configured to "monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range...monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range...electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected...monitor the line rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range...restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range...provide a visual indication when a low voltage condition is detected...provide a visual indication when a high voltage condition is detected...provide a visual indication when the line voltage is being tested."

Allos does not describe or suggest a circuit for protecting an electrical device wherein the circuit is configured to monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range, monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range, electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, monitor the line

rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range, restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range, provide a visual indication when a low voltage condition is detected, provide a visual indication when a high voltage condition is detected, and provide a visual indication when the line voltage is being tested. Moreover, Allos does not describe or suggest a circuit that is configured to monitor a line rms voltage. Rather, in contrast to the present invention, Allos describes at column 2, lines 57-59 (emphasis added), "[i]n such normal operation, during evey (sic) a.c. cycle the voltage of the cycle will exceed the low-level voltage limit on the lower voltage comparator, IC2D." At column 2, lines 65-67, Allos also recites, "[a]s the multivibrator IC4L is re-triggered every ac cycle (20 ms for 50 Hz) the output "Q1" is maintained in a logic 1 state." Further at column 3, lines 5-6, Allos recites, "[t]he window might be set at .+-.5% to .+-.15% of the peak rated value for the mains." Moreover at column 4, lines 10-18, "the described embodiment detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state...[w]hen the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state." Accordingly, Allos describes the operation of a circuit that uses the sinusoidal characteristics of the voltage supply to function and does not describe nor suggest rms characteristics of the voltage supply to function. Accordingly, for at least the reasons set forth above, Claim 20 is submitted to be patentable over Allos.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claims 1-20 be withdrawn.

The rejection of Claims 1-20 under 35 U.S.C. § 102(b) as being anticipated by Bello et al., "Bello" (U.S. Pat. No. 4,584,623) is respectfully traversed.

Bello describes an electrical load protection device that includes a window comparator circuit, which monitors the level of the line voltage supply. When the magnitude of the line voltage deviates by more than approximately 10%, above or below, from a nominal and selectable value, a regenerative delay circuit is activated. The output of the delay circuit interrupts power to the electrical load. Power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value as long as C5 is discharging through R17, R18 and R19 even in the event of the under-voltage condition correcting itself after a brief occurrence.

Claim 1 recites a method for protecting an electrical device, the method comprising the steps of "monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range...monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range...electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected...restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Bello does not describe or suggest a method for protecting an electrical device wherein the method comprises monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range, monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range, electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Specifically Bello does not describe or suggest restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Rather, in contrast to the present invention, Bello describes at column 2, lines 21-23, "the power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value." At column 3, line 67 through column 4, line 3, Bello also recites, "regenerative action through CR3 keeps Q4 in a non-conducting state for as long as C5 is discharging through R17, R18, and, R19 even in the event of the under-voltage condition correcting itself after a brief occurrence. " Q4 in a non-conducting state stops "the flow of current through bridge B1 and the coil of RY1 which cuts power to the load." Therefore Bello does not describe or suggest restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Bello.

Claims 2-9 depend from independent Claim 1. When the recitations of Claims 2-9 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2-9 likewise are patentable over Bello.

Claim 10 recites a circuit for protecting an electrical device wherein the circuit is configured to "monitor a line rms voltage to detect a rms voltage above a predetermined

voltage range...monitor the line rms voltage to detect a rms voltage below the predetermined range...electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected...restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Bello does not describe or suggest a circuit for protecting an electrical device wherein the circuit is configured to monitor a line rms voltage to detect a rms voltage above a predetermined voltage range, monitor the line rms voltage to detect a rms voltage below the predetermined range, electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected. Specifically, Bello does not describe or suggest a circuit that is configured to restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Rather, in contrast to the present invention, Bello describes that the power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value. Accordingly, for at least the reasons set forth above, Claim 10 is submitted to be patentable over Bello.

Claims 11-19 depend from independent Claim 10. When the recitations of Claims 11-19 are considered in combination with the recitations of Claim 10, Applicant submits that dependent Claims 11-19 likewise are patentable over Bello.

Claim 20 recites a circuit for protecting an electrical device wherein the circuit is configured to "monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range...monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range...electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected...monitor the line rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range...restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range...provide a visual indication when a low voltage condition is detected...provide a visual indication when a high voltage condition is detected...provide a visual indication when the line voltage is being tested."

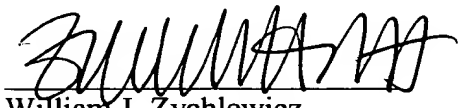
Bello does not describe or suggest a circuit for protecting an electrical device wherein the circuit is configured to monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range, monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range, electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, monitor the line rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range, restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range, provide a visual indication when a low voltage condition is detected, provide a visual indication when a high voltage condition is detected, and provide a visual indication when the line voltage is being tested. Moreover, Bello does not describe or suggest a circuit that is configured to restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range. Rather, in contrast to the present invention, Bello describes that the power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value. Accordingly, for at least the reasons set forth above, Claim 20 is submitted to be patentable over Bello.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claims 1-20 be withdrawn.

In view of the foregoing remarks, all the claims now active in the application are believed to be in condition for allowance. Favorable action is respectfully solicited.

In view of the foregoing remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,



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